

# Human

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## Wetland Conservation Through Public Involvement and EE

**Sonora, Mexico** Public participation in wetlands management planning can be hampered by a lack of awareness of the importance of wetlands and lack of knowledge of how to engage in the management planning process. Pronatura Sonora, an environmental NGO in Mexico, has developed a broad program of environmental education to overcome these obstacles. Their efforts, the Public Involvement and Education (PIE) Program, contribute to the Strategic Management Program for Coastal Wetlands, which is guided by the Biogeographic Unit of the Instituto de Estudios Superiores de Monterrey-Campus Guaymas. The program has led to a successful series of teacher-led projects in rural areas of the region, covering 11 wetland systems in a coastal area of 540,000 hectares.

In the first year of the program, 60 representatives from 25 agencies in the region participated in two three-day workshops where they developed a method for rating wetland systems and a method for identifying, assessing, and determining education and public involvement guidelines for the management plan. Those guidelines included:

- Conserve wetlands for and by the people,
- Recognize community values and reinforce the people's sense of place,
- Increase public participation through motivation, awareness, and education,
- Respect and coordinate conservation initiatives,
- Integrate community leaders in the program,
- Reinforce existing programs,
- Evaluate the results with criteria established by the community.

The Ministry of Education contributed to the process by offering human resources and infrastructure to inform citizens and encourage them to participate. They also made a commitment to support an extension program suggested by teachers during a workshop. The program and the participating agencies committed to produce materials that answer basic questions about wetlands legislation, salt production, fisheries, tourism, and multicultural perspectives.

Through the PIE Program, Pronatura Sonora launched a cycle of six workshops for teachers in four communities.

These teachers received information about wetlands and environmental education techniques that enabled them to develop school/community action projects such as habitat enhancement. Workshop materials were designed to link wetland management with public action and education. The Ministry of Education cosponsored the workshops, which were evaluated by the Federal Technical Training Committee. The workshops were incorporated in the state training program which enables teachers to receive salary increases when they reach a certain level of experience.

Teachers have an excellent multiplier effect, for not only do they directly teach students, but they are also respected commu-



EE workshops provide Sonoran people with opportunities to evaluate PIE's material and develop workshop design strategies.

nity members in towns and villages in very distant rural regions of the state. Through the initiative of several workshop participants, five teachers were trained to be workshop facilitators. They have extended the reach of PIE beyond the initial plan. These facilitators were trained to share information, design workshops, evaluate materials, and conduct field trips into wetlands. They are directing school/community action projects, such as festivals that celebrate the benefits of wetlands, and coordinating follow-up activities with the teachers.

As the PIE program continues, it will incorporate suggestions which teachers have made for improvement: new topics on wetlands ecology, teaching materials, and videos; and involve other sectors of the community such as aquaculture technicians, tourism promoters, fishermen, and farmers.

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EE workshops provide Sonoran people with opportunities to experience wetlands and reflect upon their individual relationship with wetlands.



## Consider This in Your EE&C Program

The long-term sustainability of an environmental education project is often dependent upon the degree to which the project is designed to meet the needs of various stakeholders (those groups which are involved with the project). In the article above, for example, Pronatura Sonora developed a series of workshops that the Ministry of Education would cosponsor and evaluate. This helped the Ministry expand its efforts in environmental education and provided teachers with an approved and autho-

rized professional development opportunity. It also gave Pronatura Sonora credibility in the educational community.

Analyze who needs to be involved in your program and understand their needs—from their perspectives. People are often very honest about what it will take to win their cooperation. Consider defining your stakeholders very broadly, including those who support the people with whom you will work. These indirect effects can be very powerful.

An environmental education program in Queretaro, Mexico has perfected the art of identifying and meeting stakeholders' needs: academics author publications at no charge to have the opportunity to publish; teachers attend the course to get professional advancement; Ministry of Ecology technicians improve communication and credibility problems; students and teachers appreciate locally created instructional materials because they are relevant and interesting; rural adults accept environ-

mental concepts when promoted by teachers, respected authority figures in their communities. This all adds up to a successful, sustainable education program that is contributing to environmental improvements.

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### Human Nature looks

at ways that environmental education and communication (EE&C) affect the people who affect the earth. We hope to share innovative, practical ideas from around the world, link resources with those who can use them, and consider the education and communication implications of larger political, scientific, social, and cultural events.



## A Reader Writes...

To me, environmental ethics is one of the ultimate goals of environmental education. Curriculum developers and teacher educators must launch extensive research and develop appropriate strategies for its effective development and implementation in the full spectrum of education addressing in-school and out-of-school populations. Environmental laws are essential but not enough for environmental protection and improvement; they are circumvented in many ways for financial protection and improvement. A current example is the production and illegal sale of CFC's, despite the fact that its production, use, and sale has been banned in industrialized countries since the beginning of 1996. It has become one of the most wanted chemicals in certain developing countries that do not yet have the know-how to produce substitutes. Environmental laws can be better respected if environmental ethical responsibilities, cherished by environmental education, would command the individual from within for the protection and improvement of the environment and for making sustainable development happen. In other words, environmental ethics is a person's moral guidance that would guide and control his behavior and actions with respect to the environment with or without the presence of supervisors. I strongly encourage educators around the world to consider the development of environmental ethics as a major goal of environmental education for the 21<sup>st</sup> century.

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## Combating Desertification in Malir Valley

**Malir Valley, Pakistan** In Pakistan's Malir Valley, the seasonal Malir River carries rainwater to the Arabian sea. Coarse sand and gravel along the river bottom slow the water and help replenish the groundwater aquifer. For centuries, a thriving agricultural community in the valley depended on groundwater for irrigation. But no more. Excessive sand mining along the river bed has resulted in water scarcity and desertification in the valley.

A government prohibition against sand and gravel mining in the Malir Valley was not comprehensive and the punishment was not a deterrent. As a result, bribery was commonly used by sand lifters to insure their illegal activity. The Society for Conservation and Protection of Environment (SCOPE) began to organize surveys, data collection, media announcements, and public hearings around this issue in 1992. Ultimately, their efforts led to greater awareness in local communities and an effective government ban on sand and gravel excavation in the valley.

The first step in SCOPE's efforts was a scientific study of the valley to collect information about the rate and impacts of sand and gravel mining. Results of the investigations were announced through press releases to the general public and consultation meetings with

policy makers. SCOPE discovered that the mining contributed to: lowering the water table, removal of the top soil, erosion, salt water intrusion, excessive flooding, reduction in biodiversity, increased poverty, and unemployment. The results of the scientific investigation, along with two public hearings, helped establish credibility

ment. SCOPE is also seeking more comprehensive and specific legislation to insure that sand and gravel mining will be prohibited in the Malir Valley.

Although SCOPE was extremely successful in this project, the difficulties that many environmental advocacy organizations face are clear:

- It is difficult to establish credibility and earn the trust of local people, the media, and the government in the initial stages of these projects. Involvement of scientific institutes for data collection may help to earn credibility.

- Short-term projects (such as a well or pump) may be easier to fund instead of long-term projects that work on the root of the problem and may take years to complete.

- Identifying and mobilizing the good people in government will contribute to the success of the project.

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Sand mining in Malir, man caused desertification.

for SCOPE. With such powerful information, and the original intent of the government statement against sand and gravel excavation, district authorities were compelled to take action to halt illegal mining. Now local organizations and businesses help monitor the mining operations by notifying SCOPE or the newspapers of violations.

SCOPE is continuing efforts to sustain agriculture in the Malir Valley by coordinating efforts among stakeholders, NGOs, the university, and the local govern-

## THE Nature OF Things

- Conservation-oriented television documentaries are effective ways of sharing images and stories about environmental protection issues. Not only are they a powerful medium, but they can be the centerpiece of a multifaceted information campaign. Conservation International produced a video about the "Pantanal" in Brazil, the world's largest freshwater wetland, and the issue that threatens it: the rechannelization of the Paraguay River (Hydrovia Project). The scientific and environmental communities had generated

significant controversy over the project and fortunate timing allowed the video production crew to record a key Brazilian official who had just changed his position, saying that the government would "leave the river as it is."

The video premiered in two neighboring state capitals where scientists and local authorities gathered to watch the showing. Newspaper stories and TV coverage accompanied the local airing. An educational booklet enabled teachers to use the video with classes. The publicity around

the documentary, "Voices of the Pantanal," and the Hydrovia issue helped raise conservation awareness in the region. The documentary has significantly contributed to the debate over the Hydrovia and the future of the Pantanal by making it extremely difficult to back-track from the stated position of leaving the river in its natural state. *For information, contact Haroldo Castro at CI, 1015 18th Street NW Suite 1000, Washington DC 20036 USA Tel: 202-973-2210 Email: <h.castro@conservation.org>*

- E-mail and other Internet exchanges are becoming an important communication tool for environmental education efforts. In addition to allowing more frequent exchange among environmental professionals and access to huge databanks of information, the Internet has spawned new types of educational programs. The Shorebird Sister Schools Program is a teaching unit about Arctic Nesting Shorebirds that enables students along the Pacific Flyway to track the annual spring migration of the birds to their Arctic breeding grounds. You can observe their progress at <<http://www.fws.gov/~r7envd/sssp.html>>.

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- Taroko National Park in Taiwan was established in 1986 amid the protests of local aboriginal people. They were concerned that their hunting and slash-and-burn farming lifestyle would be curtailed by the protection of the world-class Taroko Gorge within park boundaries. Because the people of Taiwan highly value education, the park initiated an environmental education program to help resolve this difference of opinion. Surrounding schools

were invited to participate in programs that explained the benefits of conservation and resource protection. Student response forms indicate that the programs are appropriate and interesting and that natural resources should be protected. Improvements in the programs could focus on initiating a new program particularly for aboriginal people that addresses their concept of natural resources. *For information, contact Mr. Ching-nan Liu, Superintendent, Takoko National Park, 291, Fu-Su Village, Hualien, Taiwan R.O.C. or Mr. Homer Wu, Stephen F. Austin State University, College of Forestry, Box 6109, Nacogdoches Texas 75962, USA, Email: <g\_wu@titan.sfasu.edu>*

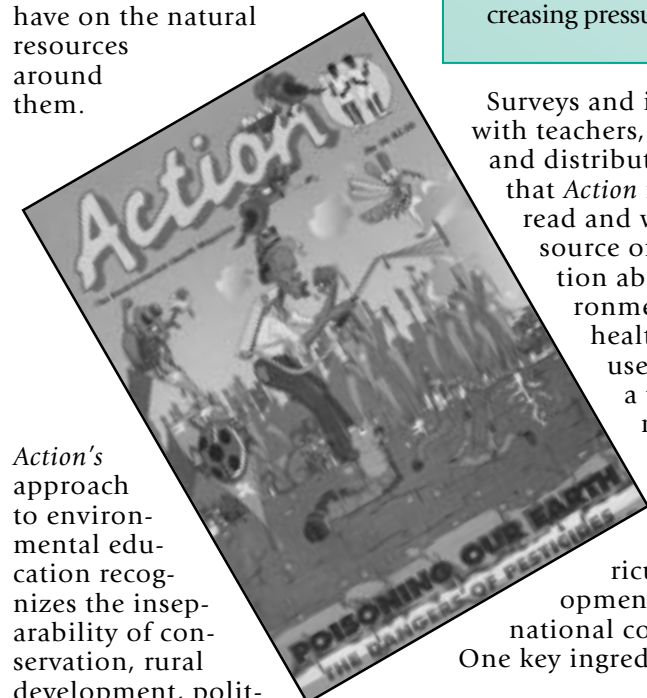


## Action for Growing Minds

**Harare, Zimbabwe** One limitation teachers around the world face in environmental education is access to relevant, interesting, and useful materials. Few rural schools have up to date textbooks, much less lively information about their own environmental issues, except in southern Africa. Thanks to *Action Magazine*, well over one million copies have been written and freely distributed to schools throughout Botswana, Lesotho, Namibia, Swaziland, Zambia, and Zimbabwe.

*Action* is an environmental and health education, communication, and training project based in Harare, Zimbabwe. For nine years, this NGO and its partners have researched, developed, and published educational materials for children and teachers. Recognizing the importance of empowering people to manage their own natural resources, *Action* developed a companion training program for teachers and communities that supports the community-based natural resource management programs in Zimbabwe.

The information in the magazine is written and pilot-tested with school children and teachers across the region before it is published, making certain that the information is appropriate and interesting. The cooperation of the six Ministries of Education and curriculum development offices makes it easier to develop, test, and distribute the material. The topics relate to the dependence the communities of southern Africa have on the natural resources around them.



*Action's* approach to environmental education recognizes the inseparability of conservation, rural development, political empowerment, and survival.

## Hunting Benefits Help Maintain Forest for Wildlife and People

**Brazilian Amazon** In the forest nearby a flowering piqui tree, a lone hunter sits, waiting patiently in the night, perched on a thin platform made of branches secured with vines between two tree trunks. When a paca comes to eat the large sweet flowers that have fallen to the ground, his careful shot will put this prized game meat in his family's dinner stew. This hunter knows of the importance of certain forest trees for attracting and feeding wildlife, and the value of wildlife in feeding his family.

In the Amazon, parks and protected areas will only ever preserve a small portion of the vast biological ecosystem. Local communities will always play an important role in the future of their forests and wildlife. They currently have several land use options: logging, farming, ranching, and non-timber forest resource extraction. To help communities understand their options and make this choice wisely, Woods Hole Research Center and the local workers union, Sindicato dos Trabalhadores Rurais de Paragominas developed a series of workshops based on participatory research with the communities in the area.

One of the communities, Quiandeua, has about 35 households. All families consume wild game, and a majority of households have members who hunt regularly. In recent years, the community noticed that game populations were declining, though none had yet become extinct in the region. Cattle ranches surrounding Quiandeua have cleared pasture over the last ten years, limiting community resources and increasing pressure on the wildlife populations.

Interactive workshops were designed with games, role plays, and discussions to convey the game population research results to the community, promote forest conservation, and facilitate community planning. The discussions helped

workshop facilitators assess the participants' understanding of the issues. For example, participants guessed the most commonly captured animals. The audiences' perceptions of resource use were fairly accurate, though some prized species (deer and paca) were over-estimated.

Maps and posters explaining where animals were captured indicated a clear habitat preference for forest, and even certain tree species. The economic and nutritional value of the wildlife was calculated based on the need to replace this food source. The workshop also conveyed examples of game and forest management actions taken in other communities.

Success of the workshops is difficult to measure in the short term, but interviews with community members after the workshop indicated that: 40% of the families relocated their agricultural clearings from primary forest to secondary forest; and one community denied loggers access to their forest, voted not to divide the forest into individual plots, and are discussing the creation of a forest reserve.

For more information, contact Margaret Cymerys  
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A workshop at which local hunters presented the information on game resources.



A hunter returns from an overnight hunt.

Surveys and interviews with teachers, students, and distributors indicate that *Action* is a widely read and well-regarded source of information about the environment and health. It is often used instead of a textbook and represents a replicable model for cost-effective curriculum development and international cooperation. One key ingredient for their

success is the participation and dialog with students and teachers during the development of the materials. The magazine itself uses several guidelines: sensitive topics are approached by recognizing that environmental behavior is often a rational response to the economic and social pressures rural residents face; gender-based differences are probed and discussed; local knowledge is respected; the interests and behaviors of role models are open for discussion; specific situations are used to introduce the larger context which affects them.

For more information, contact Steve Murray,  
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Harare, Zimbabwe  
Email: <action@mango.zw>



*Action*, a comic book magazine for students, and accompanying Teachers Pages provide environmental and health information to six nations in southern Africa.



# Resources Human Nature

## Understanding and Influencing Behaviors in Conservation and Natural Resources Management

This report presents the conclusions of a four-year study on methods for understanding and influencing human behaviors related to natural resources. Aimed primarily at planners and managers of people-oriented conservation programs, the report provides useful information to field-level implementers. Although most examples are from Africa, the principles can be applied to other regions.

The report is divided into 8 chapters. The first introduces the importance of assessing and influencing human behaviors and the critical value of participation of all stakeholders. The second chapter introduces a variety of models that educators and behaviorists have used to understand and influence environmental behaviors.

Additional chapters focus on techniques and tools to assess situations, identify appropriate behaviors, and evaluate outcomes. The goal of this text is to help practitioners become familiar with the processes and methods that have been used in other contexts, so they can adapt them to their own situations.

Available from the Biodiversity Support Program, 1250 24th Street, NW, Suite 500, Washington DC 20037, USA  
Tel: 202-778-9561  
Fax: 202-861-8324  
Email: <bsp@worldwildlife.org>

## Education for Sustainability: An agenda for action

This 80-page document represents the efforts of many agencies, businesses, and nonprofit organizations to articulate what education for sustainability means, to select examples of this work, and to recommend future actions. Its recent publication

marks not the end, but merely a marker along the path; the work to implement this agenda is now beginning. The agenda comes out of the work of the President's Council on Sustainable Development, a similarly broad effort to define the topic, select examples, and make recommendations.

Education for sustainability is defined as "a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, and commitment to engage in responsible individual and co-operative actions. These actions will help ensure an environmentally sound and economically prosperous future."

The agenda itself includes twelve actions that fall into three broad categories: formal education (school design, curriculum, professional development); nonformal education (public awareness, extension, community visioning, workforce development, adult education); and cross-cutting themes (policy changes, technology, multicultural and global perspectives). Several themes guide the initiatives that flow from the twelve actions, including:

Learning about sustainability offers opportunities to integrate content across disciplines and exercise a systems approach.

Partnerships between educational institutions and the broader community are vital.

Multicultural perspectives and knowledge must be used to achieve sustainability.

Education for sustainability will empower individuals and institutions to contribute to sustainability.

Available from the US Government Printing Office, Superintendent of Documents, Mail Stop SSOP,

Washington DC 20402-9328, USA. For more information, visit <<http://whitehouse.gov/WH/EOP/pscd/>>

## Community Sustainability — A Mini-Curriculum for Secondary Schools

This booklet provides students and teachers with information and a series of activities about sustainability and how citizens, businesses, and governments are working to achieve sustainability at the community level. The activities enable students to explore definitions of sustainability, how their community has changed over the last 50 years and how these changes affect sustainability, what changes might be in store for their community, and how they could monitor indicators of sustainability as their community begins efforts to create a future. Guidelines are provided for service learning projects that allow students to engage in community and leadership activities.

Teachers in science or social studies can successfully use this material with their classes. The five core activities are interdisciplinary and sequential; they can be completed in about three weeks.

Single copies are \$2.00 to cover the cost of printing and shipping; bulk copies for classroom use are available to international educators for the price of shipping.

The curriculum can be obtained by writing the Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, MD 20878 USA  
Email: <[general@iwl.org](mailto:general@iwl.org)>

## GIVE WATER A HAND: Local Stewardship of Water Resources

This new, second edition of Give Water A Hand materials consists of a Leader Guidebook and Youth Action

Guide. The Leader Guidebook provides valuable information to support youth in planning and carrying out projects, including background information, resources, and suggested adaptations for a variety of age groups. The Action Guide helps young people identify and address local water issues in a site they've chosen (school, community, farm/ranch, or home). Young people investigate potential water quality and conservation issues, partner with local natural resource experts to evaluate their findings, and take action on a water problem they have identified.

Young people can participate in Give Water A Hand and make a difference in their community. This Environmental Stewardship program was started in 1994 (and revised in 1996) to engage young people in environmental community service. Over 20 national agencies and organizations contributed to project development. By using the materials, young people in groups like Boy Scouts or Girl Scouts, Junior Achievement, classrooms, or 4-H clubs, can take responsibility to protect and improve our most precious resource.

To receive copies of the Give Water A Hand Leader Guidebook and Action Guide visit their Web page at <http://www.uwex.edu/erc>, or call University of Wisconsin, Extension Publications at 608-262-3346. For more information about the program, call Give Water A Hand at 1-800-WATER20.

## Green Teacher — Education for Planet Earth

Now in its sixth year, Green Teacher is a North American magazine for teachers and parents who want to promote environmental and global awareness with young

people. Full of inspiring ideas and advice from successful environmental educators, Green Teacher offers everything from visionary perspectives to ready-to-use activities and teaching units, plus handy reviews of new resources and announcements of events. Most issues include reports about environmental education efforts outside of North America.

Schoolyard naturalization, Native peoples' perspectives, sustainable development, international school twinning, multiculturalism and humane education are just a few of the themes covered in recent issues. On their web site, located at <http://www.web.ca/~greentea/>, you can find a complete index of the articles and activities that they have published. The editors welcome contributions about your efforts to promote environmental literacy. Please contact them to receive their Writers' Guidelines.

Inside the United States and Canada, one year (four issue subscriptions) cost \$22US/\$25Can. Elsewhere, a one year subscription costs \$24US for surface mail and \$29US for air mail. Contact Green Teacher, 95 Robert Street, Toronto, ON, M5S 2K5, CANADA  
Tel: 416-960-1244  
Fax: 416-925-3474  
Email: <[greentea@web.net](mailto:greentea@web.net)>

## World Resources Institute's educational materials on sustainable development and the global environment are now available on-line at

<<http://www.wri.org/wri/ed/>>. This site includes 50 down-loadable color maps and graphs depicting global conditions and trends as well as sample activities from WRI's eleven Teacher's Guides on global issues.

# Human Nature

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We welcome comments about this issue, as well as news about your environmental education or communication activity. Please send letters to the editor, articles, and other information to:

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The programs highlighted in this issue of Human Nature were presented at the International Workshop, "Using Environmental Communication Strategies to Make Environmentally Sustainable Development Happen," at the annual conference of the North American Association for Environmental Education. Over 150 people attended the workshop, which offered participants opportunities to present ideas and suggest priorities for the donor community about environmental education and communication. A database of workshop participants will be available on the Internet in English. If you would like to be included in this searchable listing of environmental education and communication practitioners, please complete and return the insert.

For more information about NAAEE's next annual conference in Vancouver Canada, contact NAAEE, Box 400, Troy OH 45373 USA  
Email: <[jthreen@igc.apc.org](mailto:jthreen@igc.apc.org)>